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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,337	11/28/2001	Pary Baluswamy	4307.1US (99-1193.1)	6253

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EXAMINER

PIZARRO CRESPO, MARCOS D

ART UNIT PAPER NUMBER

2814

DATE MAILED: 03/24/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/996,337

Applicant(s)

BALUSWAMY ET AL.

Examiner

Marcos D. Pizarro-Crespo

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,4.
- ☐ Interview Summary (PTO-413) Paper No(s). _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other:

Application/Control Number: 09/996,337 (Non-Final Rejection)
Art Unit: 2814

Page 2

Attorney's Docket Number: 4307.1US (99-1193.1)
Filing Date: 11/28/2001
Claimed Priority Date: 8/30/2000 (Divisional 09/651,790)
Applicant(s): Baluswamy et al.
Examiner: Marcos D. Pizarro-Crespo

DETAILED ACTION

This Office action responds to the amendment in paper no. 7 filed on 1/8/2003.

Continued Examination Under 37 CFR 1.114

1. A request for a continued examination under 37CFR1.114, including the fee set forth in 37CFR1.17(e), was filed in this application after the final rejection in paper no. 6, mailed on 11/6/2002. Since this application is eligible for a continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/4/2003 has been entered.

Acknowledgment

2. The amendment in paper no. 7, filed on 1/8/2003, in response to the Office action in paper no. 6, mailed on 11/6/2002, has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 1-15.

Drawings

3. The proposed drawing correction and/or the proposed substitute sheets of drawings in paper no. 8, filed on 1/8/2003, have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-9 and 11-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Kinoshita (JP 58-90728).

6. Kinoshita shows all aspects of the instant invention including an overlay target comprising at least one trench (see, e.g., fig. 1) having a bottom surface, said trench including a series of substantially vertically extending laterally continuous raised lines originating at said bottom surface of said trench (see, e.g., fig. 2).

7. Regarding claims 2 and 4, Kinoshita shows at least one continuous trench defining a geometric shape (see, e.g., fig. 1).

8. Regarding claim 3, Kinoshita further shows (see, e.g., fig. 1) a plurality of trenches (**4, 5**) defining the overlay target, each trench including a series of substantially

vertically extending laterally continuous raised lines originating at its bottom surface (see, e.g., fig. 2).

9. Regarding claim 5, Kinoshita shows an overlay target comprising a pad area (see, e.g., fig. 4) having a bottom surface, said pad area including a series of vertically extending laterally continuous raised lines originating at the bottom surface of the pad area (see, e.g., fig. 5).

10. Regarding claim 6, Kinoshita further shows (see, e.g., figs. 4) a plurality of pad areas **(41, 42, 43)** defining the overlay target, each pad area including a series of substantially vertically extending laterally continuous raised lines originating at its bottom surface (see, e.g., fig. 5).

11. Regarding claim 7, Kinoshita shows (see, e.g., figs. 4 and 5) the overlay target further comprising a trench **44** including a series of substantially vertically extending raised lines originating at the bottom of the trench.

12. Regarding claim 8, Kinoshita shows (see, e.g., figs. 1 and 4) a semiconductor wafer comprising a semiconductor substrate **1** and an overlay target having a bottom surface, said overlay target comprising at least one series of substantially vertically extending laterally continuous raised lines originating at the bottom surface of the overlay target (see, e.g., figs. 2 and 5).

13. Regarding claim 9, Kinoshita shows that the series of substantially vertically extending laterally continuous raised lines may be etched into the semiconductor substrate **1** (see, e.g., figs. 2 and 5; pp.3/col.1/ll.5-12).

14. Regarding claim 11, Kinoshita shows the series of substantially vertically extending laterally continuous raised lines disposed in at least one trench **4** (see, e.g., figs. 1 and 2).

15. Regarding claim 12, Kinoshita shows a plurality of trenches (**4, 5**) with a corresponding plurality of substantially vertically extending laterally continuous series of raised lines defining the overlay target, wherein each of the trenches includes one of the plurality substantially vertically extending laterally continuous series of raised lines (see, e.g., figs. 1 and 2).

16. Regarding claim 13, Kinoshita shows the series of raised lines disposed in at least one pad area **43** (see, e.g., fig. 5).

17. Regarding claim 14, Kinoshita shows a plurality of pad areas (**41, 42, 43**) with a corresponding plurality of substantially vertically extending laterally continuous series of raised lines defining the overlay target, wherein each of the pad areas includes one of the plurality of series of raised lines (see, e.g., figs. 4 and 5).

18. Regarding claim 15, Kinoshita shows the series of substantially vertically extending raised lines comprising a first series of raised lines disposed in a pad area **43** and a second series of raised lines disposed in a trench **44** (see, e.g., fig. 5).

Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

21. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deguchi (JP 62-18714) in view of Kinoshita (JP 58-90728).

22. Deguchi shows (see, e.g., fig. 2) all aspects of the instant invention including a semiconductor wafer comprising a semiconductor substrate **10** and an overlay target **28** having a bottom surface, said overlay target comprising at least one series of substantially vertically laterally continuous extending raised lines originating at the bottom surface of the overlay target **28**.

Deguchi, however, fails to show a top view of the overlay target showing that the raised lines are also laterally continuous. In spite of this, Deguchi discloses (pp.3/col.1/ll.5-17) that his alignment-mark forming-technique differs from the conventional one in those steps involving a mark material layer, which is eliminated from his method steps. Deguchi (pp.2/col.2-4) further gives Kinoshita, who clearly shows laterally continuous raised lines, as an example of a conventional technique

(see, e.g., Kinoshita/fig.1). Since the differences between Deguchi and Kinoshita are the method steps involving the use of the mark material layer, it would have been obvious at the time of the invention to one of ordinary skill in the art that Deguchi's raised lines are also laterally continuous.

23. Regarding claim 10, Deguchi shows that the at least one series of raised lines may be etched into a material layer **27** overlying the semiconductor substrate **10** (see, e.g., abstract and fig. 2).

Response to Arguments

24. The applicants argue:

Kinoshita does not anticipate the invention as recited in amended claims 1, 5, and 8. In particular, Kinoshita fails to show a series of substantially vertically extending lines. Kinoshita differently shows the raised lines having an arc-shaped cross-sectional area. It is not possible for Kinoshita's raised lines to be substantially vertically extending raised lines because they have an arc-shaped cross-sectional area. The line formed by a circle constantly changes direction locally and thus cannot be substantially vertical. Therefore, Kinoshita does not anticipate the raised lines recited in the claims.

The examiner responds:

The arc-shaped cross-sectional area of Kinoshita's raised lines does not preclude them from being a series of *substantially vertically extending* raised lines. Actually, Kinoshita clearly shows the raised lines *extending in the vertical direction*. See, for example, figure 2, where Kinoshita shows a series of *upright* raised lines *extending in the vertical direction* from the bottom of a trench **4**.

25. Applicant's arguments in paper no. 7 with respect to claims 8 and 10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

26. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

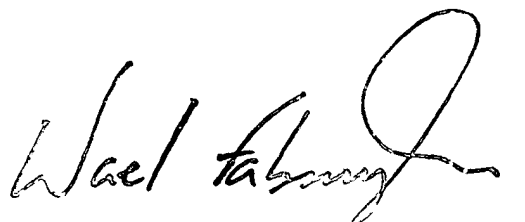
27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Marcos D. Pizarro-Crespo** at **(703) 308-6558** and between the hours of 9:30 AM to 8:00 PM (Eastern Standard Time) Monday through Thursday or by e-mail via Marcos.Pizarro@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on (703) 308-4918.

28. Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

Art Unit: 2814

29. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/797; 438/401,462,975	3/14/2003
Other Documentation: PLUS Analysis	6/5/2000
Electronic Database(s): EAST (USPAT, EPO, JPO)	3/14/2003



SUPERVISORY PRIMARY EXAMINER
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